

AMENDMENTS TO THE SPECIFICATION:

Please substitute the following amended paragraph for the pending paragraph beginning on page 5, line 23.

FIG. 4 illustrates the printing workflow system 2 interacting with a cell in a network provided in a print server. The product cell controller 16 for the cell receives a sub-job 48 from the server 20 to be further processed by the cell. The server 20 stores in its storage 23 the capacities and capabilities of each cell in the print shop to produce different product-types. For example, cell 32 in the network produces three different types of documents and cell 40 produces two types of documents. (It is quite possible that two different cells can produce similar document types. A document type is uniquely characterized by the sequence of processing steps to completely finish the document) The server 20 stores this information to determine which cell has the capabilities to process a document job. The printing workflow system 2 also stores the capacity of each cell to determine the volume of a particular product-type that a cell can produce. As stated above, the job decomposition module 14 splits a document processing job into sub-jobs to be sent to various autonomous cells for processing. The cells in the network are autonomous and can produce their respective product entirely by themselves. Thus, in the example shown in fig. 4, a document processing job is split into sub-jobs 48 and 50 that are sent to cells 32 and 40, respectively. The product cell controllers 34 and 42 send the sub-jobs 48 and 50 to devices 36, 37, 38 and 44, 45, 46 in the respective cells 32 and 40 for processing.

Please substitute the following amended paragraph for the pending paragraph beginning on page 7, line 10.

The workflow mapping module 12 determines workflow so that the workflow is reasonable for the cell and device arrangements. For

example, if the print shop only has one printer to print blue-type envelopes with red and black lettering, then the workflow mapping would not split sub-job 50 into two lots for two print devices. The workflow mapping module 12 splits sub-job 50, which requires 1000 pages with letterhead A and B into lots 56 and 58, where 500 pages with letterhead A and 500 pages ~~of~~with letterhead B are printed. The other modules 14, 16, 18 of the printing workflow system 2 use the workflow mapping module 12 to aid in distributing sub-jobs among the various cells in the network.

Please substitute the following amended paragraph for the pending paragraph beginning on page 8, line 6.

Each document processing job 62 is composed of a set of parameters that define its structure. FIG. 9 shows an example of some parameters for a document processing job. The document processing job 80 is comprised of a set of defined parameters 84, 86, 88, 90, 82. These parameters 84, 86, 88, 90, 82 are provided by a customer and inputted into the network with or without human intervention. The printing workflow system 2 validates the document processing job 80 to ensure that the job 80 is valid and contains all relevant parameters 84, 86, 88, 90, 82 to process it. The printing workflow system 2 parses the document processing job 80 to guarantee validity of the job. The data parameter 84 defines the due date that a particular document processing job needs to be completed. Also, data parameters 86 and 88 defines the quantity of a product-type to be processed in the document processing job 80 and the method of delivery (UPS or FedEx) being used to deliver the completed document processing job 80. The data parameter 90 defines the method of payment (credit card, debit, check) for the completed document processing job 80. The data parameter 90 82 defines any special processing instructions that are not stipulated in data parameters 84, 86, 88, 90 that are additionally necessary to completely process the job. For example, sending a portion of

document processing job 80 to one location using one method of delivery while sending the other portion to another location using a different method of delivery.

Please substitute the following amended paragraph for the pending paragraph beginning on page 8, line 24.

FIG. 10 illustrates a product cell controller (PCC). Once the cells 72, 74, 76 receive their respective sub-jobs 66, 68, 70 each cell 72, 74, 76 employs its product cell controller (PCC) 116 for managing further processing of the sub-jobs. As shown in FIG. 8, the job decomposition module 64 performs the splitting of the job into sub-jobs and sends the sub-job information 66, 68, 70 to the respective cells. At this point, a cell 100 receives information to process one of these sub-jobs 98. The PCC 102 for the cell 100 receives the sub-job 98 for further processing. The PCC 102 further splits the sub-job 98 into lots 104, 106, 108 for processing. PCC 102 uses the workflow system 96 of document processing job 94 to assign which devices 110, 112, 114 to use to accomplish processing the sub-job 98. The optimal lot size is determined by analyzing the workflow of the document processing job 94 and characteristics of its various elements. The PCC 102 has the ability to adjust the lot-size. For example, cell 98 100 may take the document processing job 94 size of 300,000 and split them into lot sizes of 150,000 to be distributed among the two devices 110, 112, 114.

Please substitute the following amended paragraph for the pending paragraph beginning on page 9, line 19.

FIG. 12 illustrates using a cell assignment module to assign sub-jobs to cells. The printing workflow system 130 stores all the necessary information 132 used by the cell assignment module, such as maximum capacity, current capacity and current loading of a cell. Essentially, the print workflow system 130 updates all the necessary information 132 of cells 138, 140, 142 if there is adding or removal of devices in a particular cell. Having the printing workflow system 130 update all of the necessary information 132, allows cell assignment

module access to updated information without retrieving such information from the cells 138, 140, and 142 and 134. The cell assignment module 136 follows various steps before the determination of which cells 138, 140, and 142 will handle sub-job 134.

Please substitute the following amended paragraph for the pending paragraph beginning on page 6, line 27.

The workflow working mapping module 12 of the printing workflow system 2 determines the workflow for document processing jobs. Workflow is represented strategically as a tree diagram. Fig. 7 illustrates as example embodiment of a workflow tree diagram. Once the printing workflow system 2 reviews an input document processing job, the workflow mapping module 12 generates a tree diagram representation of the document processing p~~ro~~cess job- and the input that outlines the sequence of operations that need to be performed to complete and deliver the document processing job. For example, the workflow 46 demonstrates a document processing job to print fifty blue envelopes with red and black lettering and to print 1000 pages of a certain document with black lettering of two kinds of letterhead A & B. The workflow mapping module splits the fifty blue-type envelopes with red and black lettering and the 1000-page document with black lettering of two kinds of letterhead A & B into sub-jobs 48, 50. Thus, creating two sub-jobs 48, 50 that are mutually independent from each other. Given that sub-job 48 requires fifty blue envelopes, 25 blue envelopes having red lettering and 25 blue envelopes having black lettering. The product printing cell controller 16 further splits sub-job 48 into two lots 52, 54.